

1.(original) A method for forming a high temperature superconductor (HTS) conductor or cable comprising transposed conductor elements comprising:

forming a layer of an HTS on one or more substrates and cutting the substrate(s) with an HTS layer thereon or at least one substrate into a multiple number of generally longitudinally extending serpentine conductor elements each comprising a series of element portions which periodically change direction relative to one another in a plane of the substrate, or cutting one or more planar substrates to form a multiple number of generally longitudinally extending serpentine substrate elements each comprising a series of element portions which periodically change direction relative to one another in a plane of the substrate, so that said serpentine conductor elements are cut from the larger substrate back-to-back with similarly oriented element portions of the serpentine conductor elements being cut from common parts of the larger substrate across a width of the substrate and forming a layer of an HTS on a surface of the serpentine substrate elements, and

interleaving such serpentine conductor elements to form a longitudinally extending transposed conductor HTS conductor or cable.

2.(original) A method according to claim 1 including forming a layer of an HTS on one or more planar substrates and cutting the substrate(s) to form a multiple number of generally longitudinally extending serpentine conductor elements each comprising a first series of element portions having a generally common longitudinal axis and a second series of element portions having a generally common longitudinal axis which is spaced from the longitudinal axis of said first series of element portions in a plane of the substrate, with connecting portions of the conductor elements between.

3.(original) A method according to claim 1 including cutting one or more planar substrates to form a multiple number of generally longitudinally extending serpentine substrate elements each comprising a first series of element portions having a generally common longitudinal axis and a second series of element portions having a generally common longitudinal axis which is spaced from the longitudinal axis of said first series of element portions in a plane of the substrate, with connecting portions of the substrate elements between, and forming a layer of an HTS on a surface of the serpentine substrate-elements.

4.(original) A method according to claim 2 wherein the element portions of said first series of conductor elements and the element portions of said second series of conductor elements are longer than said connecting portions between.

5.(original) A method according to claim 3 wherein the element portions of said first series of substrate elements and the element portions of said second series of substrate elements are longer than said connecting portions between.

6.(original) A method according to claim 1 including forming a layer of an HTS on one or more substrates and cutting the substrate(s) with the HTS layer thereon to form a multiple number of generally longitudinally extending serpentine conductor elements each comprising a first series of spaced generally parallel element portions which extend at an angle across a longitudinal axis of the conductor element in a first direction and a second series of spaced generally parallel element portions which extend across the longitudinal axis of the conductor element in an opposite direction.

7.(original) A method according to claim 6 including cutting the substrate(s) with the HTS layer thereon to include connecting portions of the conductor elements between adjacent ends of each of said element portion of said first series of element portions and an element portion of said second series of element portions.

8.(original) A method according to claim 1 including cutting one or more planar substrates to form a multiple number of generally longitudinally extending serpentine substrate elements each comprising a first series of spaced generally parallel element portions which extend at an angle across a longitudinal axis of the substrate element in a first direction and a second series of spaced generally parallel element portions which extend across the longitudinal axis of the conductor element in an opposite direction.

9.(original) A method according to claim 8 including cutting the substrate(s) to include connecting portions of the substrate elements between adjacent ends of each said element portion of said first series of element portions and an element portion of said second series of element portions.

Claims 10-26 (cancelled)

27.(original) A high temperature superconductor (HTS) conductor or cable comprising a number of transposed conductor elements which comprise a layer of an HTS on a substrate element cut in a longitudinally extending serpentine form from a larger substrate back-to-back with similarly oriented element portions being cut from common parts of the larger substrate across the width of the larger substrate.

28.(original) An HTS conductor or cable according to claim 27 wherein said conductor elements each comprise a series of element portions which periodically change direction relative to one another in a plane of the substrate.

29.(original) An HTS conductor or cable according to claim 28 wherein said conductor elements each comprise a first series of element portions having a generally common longitudinal axis and a second series of element portions having a generally common longitudinal axis which is spaced from the longitudinal axis of said first series of element portions in a plane of the substrate, with connecting portions of the conductor elements between.

30.(original) An HTS conductor or cable according to claim 29 wherein the element portions of said first series of conductor elements and the element portions of said second series of conductor elements are longer than said connecting portions between.

31.(original) An HTS conductor or cable according to claim 28 wherein said conductor elements each comprise a first series of spaced generally parallel element portions which extend at an angle across a longitudinal axis of the conductor element in a first direction and a second series of spaced generally parallel element portions which extend across the longitudinal axis of the conductor element in an opposite direction.

32.(original) An HTS conductor or cable according to claim 31 including connecting portions of the conductor elements between adjacent ends of each of said element portion of said first series of element portions and an element portion of said second series of element portions.

Claims 33-48 (cancelled)

49.(new) A method for forming a high temperature superconductor (HTS) conductor or cable comprising transposed conductor elements comprising:

forming a layer of an HTS on one or more substrates and cutting the substrate(s) with an HTS layer thereon into a multiple number of generally longitudinally extending serpentine conductor elements, or providing a multiple number of generally longitudinally extending serpentine substrate elements and forming a layer of an HTS on a surface of said elements to form a number of conductor elements, said longitudinally extending serpentine conductor elements each comprising a first series of spaced generally parallel element portions which extend at an angle across a longitudinal axis of the conductor element in a first direction and a second series of spaced generally parallel element portions which extend across the longitudinal axis of the conductor element in an opposite direction, or

providing one or more longitudinally extending serpentine substrate element(s) and forming a layer of an HTS thereon and cutting the serpentine substrate element(s) with an HTS layer thereon into a number of shorter generally longitudinally extending serpentine conductor elements, or cutting one or more longitudinally extending serpentine substrate element(s) into a number of shorter generally longitudinally extending serpentine conductor elements and forming a layer of an HTS on the conductor elements, said longitudinally extending serpentine conductor elements each comprising a first series of spaced generally parallel element portions which extend at an angle across a longitudinal axis of the conductor element in a first direction and a second series of spaced generally parallel element portions which extend across the longitudinal axis of the conductor element in an opposite direction, and

interleaving such serpentine conductor elements to form a longitudinally extending transposed conductor HTS conductor or cable.

50.(new) A method according to claim 49 including cutting one or more planar substrates to form a multiple number of generally longitudinally extending serpentine substrate elements each comprising a first series of spaced generally parallel element portions which extend at an angle across a longitudinal axis of the substrate element in a first direction and a second series of spaced generally parallel element portions which extend across the longitudinal axis of the conductor element in an opposite direction.

51.(new) A method according to claim 49 including interleaving the resulting serpentine conductor elements to form a longitudinally extending HTS conductor or cable in which individual conductor elements are transposed relative to other conductor elements both in the plane of the conductor elements and orthogonal to the plane of the conductor elements.

52.(new) A method according to claim 51 including interleaving the conductor or elements so that each serpentine conductor element is transposed with an adjacent conductor element in plane, out of plane, or both, once per each said element portion of each conductor element.

53.(new) A high temperature superconductor (HTS) conductor or cable comprising a number of transposed conductor elements which comprise either a layer of an HTS on a substrate element cut in a longitudinally extending serpentine form from a larger substrate or a layer of an HTS applied to a substrate element having a longitudinally extending serpentine form, said conductor elements each comprising a first series of spaced generally parallel element portions which extend at an angle across a longitudinal axis of the conductor element in a first direction and a second series of spaced generally parallel element portions which extend across the longitudinal axis of the conductor element in an opposite direction.

54.(new) An HTS conductor or cable according to claim 53 wherein the conductor elements are interleaved so that individual conductor elements are transposed relative to other conductor elements both in the plane of the conductor elements and orthogonal to the plane of the conductor elements.

55.(new) An HTS conductor or cable according to claim 54 wherein the conductor elements are interleaved so that individual conductor elements are transposed with an adjacent conductor element either in plane, out of plane, or both, once per each said element portion of each conductor element.

56.(new) A high temperature superconductor (HTS) conductor or cable comprising a number of transposed conductor elements which comprise either a layer of an HTS on a substrate element cut in a longitudinally extending serpentine form from a larger substrate or a layer of an HTS applied to a substrate element having a longitudinally extending serpentine form, at least some of the conductor elements being oriented such that the HTS layers of adjacent conductor elements face and directly or indirectly electrically contact each other at points along the length of the conductor or cable.

57.(new) An HTS conductor or cable according to claim 56 wherein about half of the conductor elements are oriented such that the HTS layers of adjacent conductor elements face and directly or indirectly electrically contact each other at points along the length of the conductor or cable.

58.(new) An HTS conductor or cable according to claim 56 wherein said conductor elements each comprise a series of element portions which periodically change direction relative to one another in a plane of the substrate.

59.(new) An HTS conductor or cable according to claim 58 wherein said conductor elements each comprise a first series of element portions having a generally common longitudinal axis and a second series of element portions having a generally common longitudinal axis which is spaced from the longitudinal axis of said first series of element portions in a plane of the substrate, with connecting portions of the conductor elements between.

60.(new) An HTS conductor or cable according to claim 59 wherein the element portions of said first series of conductor elements and the element portions of said second series of conductor elements are longer than said connecting portions between.

61.(new) An HTS conductor or cable according to claim 56 wherein said conductor elements each comprise a first series of spaced generally parallel element portions which extend at an angle

across a longitudinal axis of the conductor element in a first direction and a second series of spaced generally parallel element portions which extend across the longitudinal axis of the conductor element in an opposite direction.

62.(new) An HTS conductor or cable according to claim 61 including connecting portions of the conductor elements between adjacent ends of each of said element portion of said first series of element portions and an element portion of said second series of element portions.

63.(new) An HTS conductor or cable according to claim 56 wherein the conductor elements are interleaved so that individual conductor elements are transposed relative to other conductor elements both in the plane of the conductor elements and orthogonal to the plane of the conductor elements.